

## WIDE AREA FORMATION OF INTERMEDIATE AND DEEP WATER IN THE NORTHERN LEVANTINE BASIN, 1992

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The Rhodes cyclonic gyre is a permanent feature of the Levantine Basin circulation, identified in all seasons in the region south of the Anatolian peninsula and the Island of Rhodes. The heat stored by the upwelling dome of the cyclonic area is substantially lower than the surrounding water masses, and the preconditioning due to homogenisation of the water column (excluding a thin  $\sim 50\text{m}$ - surface layer) makes it a candidate for episodes of deep convection. However, either the duration of such events may be short, or they may occur when a sufficiently strong winter forcings are available, and therefore such overturning has not been widely reported. One exception is Gertman *et al.* (1990), who observed deep convection during the cold winter of 1987, following earlier suggestions of Deep Water formation in the region by Ovchinnikov and Plakhin (1984).

Deep convection at the center of the Rhodes Gyre was observed during March 1992, following the cold winter of 1991/1992 (Fig. 1). The thin surface layer overtopping the Rhodes dome during earlier observations of October 1991 has been eroded completely, leading to overturning of central waters to depths in excess of 1000m. Uniform temperature ( $13.7^\circ\text{C}$ ) and salinity (38.7) values are observed throughout the water column within the gyre. Sharp horizontal gradients occur on the northeast side of the uniform region separating it from the more saline ( $\geq 38.95$ ) Levantine Intermediate Water near the coast.

The intermediate depth convection leading to Levantine Intermediate Water formation was observed in the entire northern Levantine Basin, characterised by uniform profiles of temperature and salinity to depths larger than 300m. The deepest such formation occurred in the Cilician basin, where the base of the convection layer reached 700m.

The well-defined circulation observed in the October 1991 survey prior to the winter cruise is greatly modified by the convection process. Separate patches of cyclonically and anticyclonically tending circulations are found in the March 1992 analyses, which may indicate continuing geostrophic adjustment.

### References:

Gertman, I. F., I. M. Ovchinnikov, and Y. I. Popov, (1990). Deep convection in the Levantine Sea, CIESM XXXIInd Congress, Parpignan, France.

Ovchinnikov, I. M. and E. A. Plakhin, (1984). Formation of Mediterranean Intermediate Water in Rhodes cyclonical gyre, *Oceanology*, 24, 317-319.

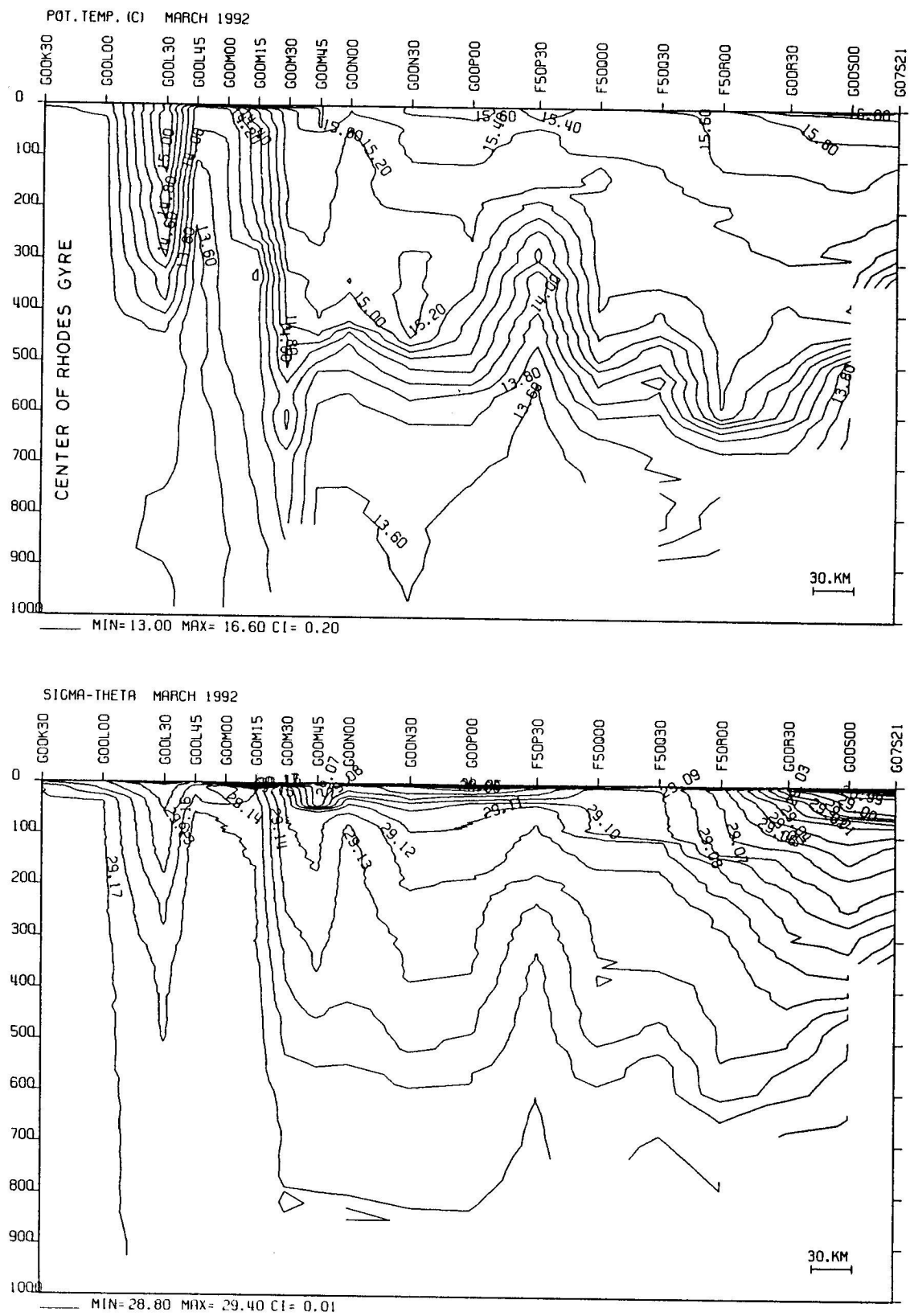


Figure 1. West to east sections along 36°E.